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SURVEY NOTES

Vol. 11, No. 1 Service to the State of Utah February 1977

Weighty Matters . . .

MFS' BEST FROND

The discovery in 1976 of a near-perfect fossil palm frond in the Laney Shale Member of the Green River Formation (Eocene) near Kemmerer, Wyoming, produced a handsome paleontological specimen for Mountain Fuel Supply Company.

Trimmed from the bed in which found, the frond ended up neatly centered in a 36-square-foot slab of limy

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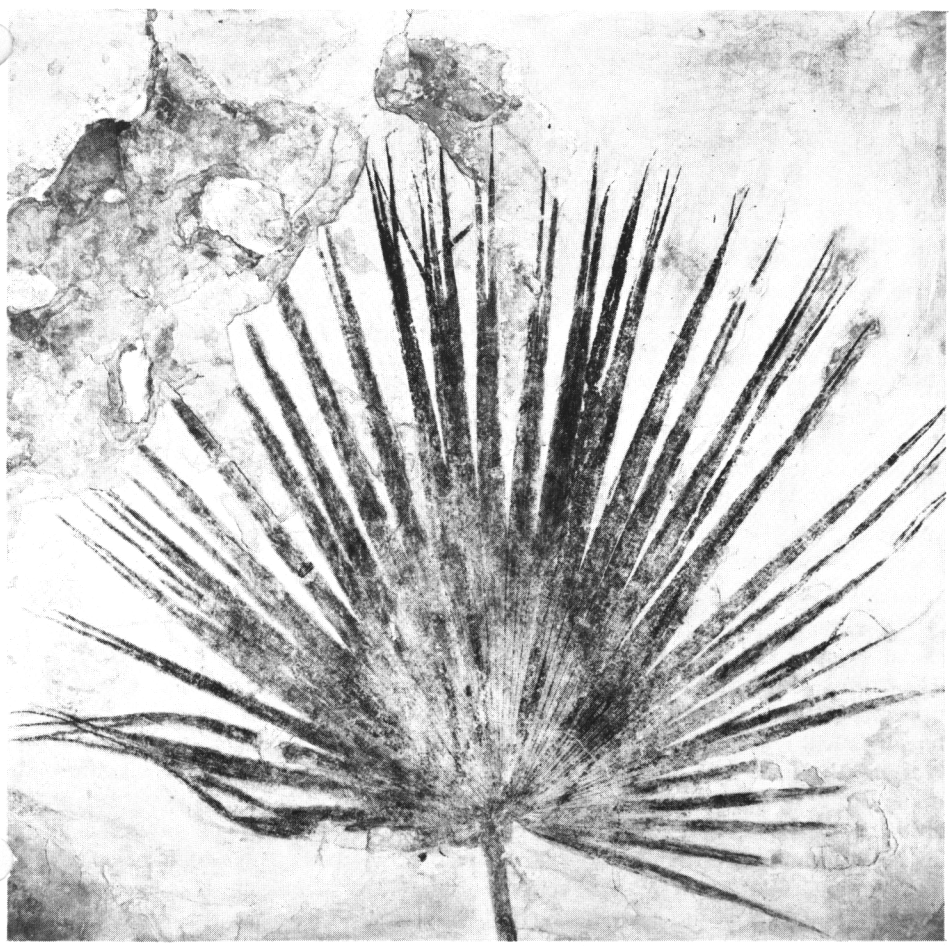

Palm frond was preserved by Brigham Young University's Geology Department. Approximate size of slab is 6 feet by 6 feet. *(Photo courtesy of Brigham Young University Geology Department)*

Fewer Barrels, Fewer Dollars . . .

Oil Production Drops In Utah

Production of oil in Utah reached an all-time peak of 40 million barrels in 1975, highest since 39.9 million barrels in 1959. This record was not surpassed in 1976, and the record level may never be reached again. Production of 40 million barrels per year requires a sustained volume of 109,600 barrels per day, and Utah's daily average has slipped far below this level. In early December 1976, the estimated daily production was 94,000 barrels.

According to the monthly oil and gas production report issued by the Utah Division of Oil, Gas and Mining, oil production during the first 9 months of 1976 compared with the same period in 1975 was down 13.9 percent. At the end of September 1976, production was slightly more than 25,856,600 barrels for the year.

Most oil production in Utah comes from the following large fields: Greater Altamont-Bluebell, Greater Aneth, Greater Red Wash, Upper Valley, Lisbon, Bridger Lake, and Pineview. In 1976 these fields contributed almost 97 percent of the State's total, and in cumulative production they have contributed slightly more than 94 percent of the State's 578 million barrels. The remaining 50 or so fields are relatively minor in size. In 1976 Pineview replaced Ashley Valley field, Uintah County, on the list of the seven largest fields in Utah.

Utah's record oil production in 1975 was achieved mainly by prolific production from the giant Greater Altamont-Bluebell field in Duchesne and Uintah Counties. Discovered in 1970, this field produced 22.3 million barrels in 1975 from over 300 wells, almost 58 percent of Utah's total. Production averaged about 63,000 barrels per day for the year.

Most of the rest of Utah's oil production in 1975 came from older fields, many of which are in advanced stages of declining output. Peak production from Greater Altamont-Bluebell was able to reverse the overall decline in 1975.

The Greater Altamont-Bluebell field reached its natural production peak in July 1975 and then began its own

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SURVEY RELEASES LATEST STUDIES

The latest publications of the Utah Geological and Mineral Survey are available through the UGMS Publication Sales Office, 606 Black Hawk Way, Salt Lake City, Utah 84108. When ordering by mail, add 10% for handling and mailing charges–minimum charge is $.25.

Bulletin 110, *Fluorite Occurrences in Utah,* by K. C. Bullock ($4.50). Bulletin 110 reports on 112 fluorite deposits ranging in importance from minor mineral occurrences to producing fluorite mines within 10 Utah counties. The Bulletin contains 89 pages, 33 figures, and 1 table, which shows the shipments of finished fluorspar in the State.

Water-Resources Bulletin 21, *Model for Evaluating the Effects of Dikes on the Water and Salt Balance of Great Salt Lake, Utah,* by K. M. Waddell and F. K. Fields ($2.50). Water-Resources Bulletin 21 contains 54 pages, 12 figures, 19 tables, and an appendix. This study was prepared by the U. S. Geological Survey in cooperation with the Utah Geological and Mineral Survey.

Water-Resources Bulletin 22, *Great Salt Lake, Utah: Chemical and Physical Variations of the Brine, Water-Years 1974 and 1975,* by J. A. Whelan and Carol A. Petersen ($2.50). Water-Resources Bulletin 22 contains 47 pages, 10 figures, 8 tables, and 3 appendixes.

UGMS has its unpublished Reports of Investigation on open-file. These recent reports may be examined at the UGMS offices:

Report of Investigation No. 112, *Preliminary Geology Reconnaissance of Pioneer Trail Subdivision, Morgan County, Utah,* by Muhammed A. Raja, October 1976, 5 p.

Report of Investigation No. 113, *Preliminary Environmental Geologic Reconnaissance of Lost Creek State Park,* by Bruce N. Kaliser, November 1976, 3 p.

DIGGIN'S

Gold

A piece of volcanic rock containing the largest amount of gold ever found in a single specimen in Colorado was discovered on October 3, 1975, at Summitville. The rock, weighing 141.5 pounds and containing nearly 30 troy pounds of gold (23.9 pounds avoirdupois!), was found by a bulldozer operator who had gone to assist the driver of a stalled truck. The gold is valued at more than $350,000. The specimen has been contributed to the Denver Museum of Natural History by the property owners and ASARCO, the lessee of the property.

Weekend prospectors may take heart from the knowledge that the discovery was a rather nondescript boulder lying undisturbed on a hillside in a mining district active for 100 years.

Quite a Haul

Some Utahns have looked more than twice and wondered mightily about those big tankers rolling down the highway with the lettering in Spanish "Idriocarbonos de Chihuahua." Can it be that Utah petroleum products are being sold as far away as Mexico?

The answer is "si." At certain times of the year and under very special market situations, products such as propane from the mixed stream of light refining gases produced at the Plateau Refining plant at Roosevelt in the Uinta Basin can be economically transported 850 miles to El Paso, Texas, and thence into Chihuahua, Mexico. Quite a haul, indeed.

New Uranium Plant

Recovery of 143,000 pounds per year of uranium oxide is expected in late 1977 from a plant to be constructed near Copperton, southwest of Salt Lake City. The plant will recover the uranium from leach solutions used by Kennecott Copper in removing copper from overburden through precipitation. Wyoming Mineral Corporation, Littleton, Colorado, a subsidiary of Western Westinghouse Electric, will construct the plant, which is to cost about $6 million. About 13 persons will be employed when the plant is fully operative.

U.S. Steel's Filters

Filters that will clean about 825,000 cubic feet of flue gas per minute will be installed in April at U. S. Steel's Geneva Works by Pittsburg Air Pollution Control Division of Wheelabrator-Frye, Incorporated. The installation at the plant's three steam boilers is expected to reduce the visible pollutants about 50 percent. The work should be complete by March 1978.

Border Defined

A short paper in the Spring issue of *Utah Geology* will discuss the boundary between Uintah and Grand Counties immediately west of the Utah-Colorado boundary. The boundary is shown in various ways on maps issued by Federal and State agencies and commercial map companies. The correct boundary is defined by the Utah Code Annotated, 1953, Sections 17-1-13 and 17-1-27 as amended, and it is shown on U. S. Geological Survey topographic quadrangle, Jim Canyon, Utah-Colorado, 1970.

Deepest Well in Region

Union Oil Company has completed the deepest well in the Rocky Mountain region in the Hells Half Acre Unit, Natrona County, Wyoming. The well bottomed in Madison Limestone (Mississippian) at 22,431 feet and was completed as a gas well from Frontier Sandstone (Upper Cretaceous) at 18,510-18,907 feet.

Utah's depth record is a 21,786-foot dry hole drilled in 1976 in Summit County by CIG Exploration (see *Survey Notes,* Vol. 10, No. 3, August 1976).

Skyline and Texas Eastern

A Utah-based company, Skyline Oil, will merge with a larger company in 1977. Skyline has reached an understanding with Texas Eastern Corporation, Houston, Texas, in which Skyline will become a wholly-owned subsidiary of Texas Eastern through an exchange of stock. Indicated value of the exchange is about $18.24 million. It is expected that Skyline's Rocky Mountain regional interests in oil and gas, oil shale, and tar sands will continue to be operated from Salt Lake City.

Economic Geology Section . . .

UGMS On Fuels, Metals, and Nonmetals

The Economic Geology Section of the Utah Geological and Mineral Survey has been responsible for recent studies on the mineral resources of Utah. Hellmut H. Doelling, section chief, heads a staff of 5 full-time and 2 part-time geologists and an occasional geologic consultant in an on-going inventory of the State's mineral potential.

Through a grant from the U. S. Bureau of Mines, UGMS has begun its second year in studying the methane content of Utah coals. Under the supervision of Dr. Doelling and staff geologist, Fitzhugh D. Davis, UGMS will continue to test coal cores for methane. UGMS is still looking for donors of fresh coal cores from drilling in Utah. Also, as part of the grant, UGMS will be gathering all data on the coal beds of the Book Cliffs field, including isopach maps, overburden maps, correlation diagrams, locations and extents of wants (the part of a coal seam where coal should be present but is absent), and a bibliography of Utah coal.

The UGMS open-file report, retitled *Coal Drilling at Trail Mountain, North Horn Mountain, and Johns Peak Areas, Wasatch Plateau, Utah,* by Fitzhugh D. Davis and Hellmut H. Doelling, is being prepared for publication as a Bulletin. The drilling project in 1975 revealed significant new reserves of coal.

One study by consulting geologist, Kenneth C. Bullock, has been published recently as Bulletin 110, *Fluorite Occurrences in Utah*. Dr. Bullock has also completed an update of Bulletin 88, *Iron Deposits of Utah,* through a grant to UGMS from USBM. Bulletin 88 will not be republished, but a copy of the revision is on open-file at UGMS offices for public inspection. Both projects are part of USBM's Minerals Availability System (MAS), a computerized inventory of the nation's resources.

Under another grant from USBM, a report on the lead-zinc occurrences in Utah is in final preparation. Lee I. Perry and Blair McCarthy, staff geologists in charge of the study, have surveyed 42 mining districts and looked at 225 mines. Utah is a major producer of lead and zinc. Today, 4 mines produce annually about 400,000 tons of lead-zinc ore. The study, prepared also for USBM's MAS, will be published as a Bulletin.

Work continues on updating the uranium part of UGMS' file on mineral deposits. Uranium deposits in the San Rafael River mining area have been studied by Larry M. Trimble, staff geologist, and Dr. Doelling under a grant from the U. S. Geological Survey. The report is being processed for publication as a Bulletin. The San Rafael River area offers good possibilities for continued uranium production.

Reports on the geology and mineral resources of Wayne, Box Elder, and Kane Counties are under way. Mr. Trimble has measured sections across Wayne County to correlate the geology. He will be compiling a geologic map and evaluating the mineral deposits. Uranium and coal are the main minerals in Wayne County.

The report on Box Elder County, including a geologic map, is being finished by Dr. Doelling for publication as a Bulletin. For Kane County Dr. Doelling has completed the library research and one-third of the field work. Kane County has coal and uranium resources.

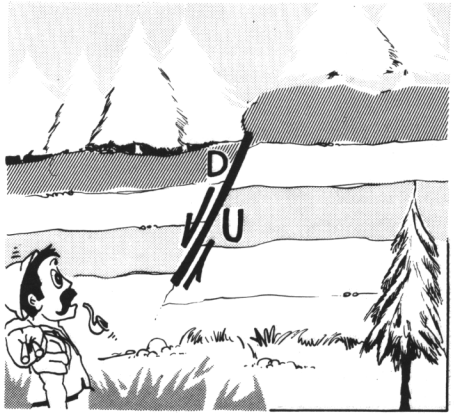
The geology and ore deposits of Big Cottonwood district are being studied by consulting geologist, Laurence P. James. The report is nearly complete and will be published. The Big Cottonwood district has been one of Utah's major and historic producers of silver, lead, copper, gold, and zinc ores.

NEW STAFF MEMBER

Deanna Spendlove has been hired by the Utah Geological and Mineral Survey as the sales clerk in the Publication Sales Office. Miss Spendlove, who was formerly employed in the insurance office of St. Benedict's Hospital in Ogden, replaces June Scherzinger who resigned to begin college studies at the University of Utah.

ROCKY RIDGES

by Greg McLaughlin



OIL PRODUCTION DROPS

(continued from page 1)

decline, an expected phenomena related to the nature of the reservoir and the problems in producing the viscous, waxy oil. However, the decline is clearly more drastic than normal. From the 63,932 barrel-per-day rate in July 1975, Greater Altamont-Bluebell slipped to 46,643 barrels per day in July 1976. In July 1975, Greater Altamont-Bluebell produced 58.2 percent of the oil production in the State. In July 1976, the field produced 51.2 percent of the total monthly production. For September 1976, Greater Altamont-Bluebell produced 47,406 barrels per day, and only 51.0 percent of the month's total production for the State. In just a little over 12 months, production from the field dropped 17,000 barrels per day. Translated into dollars this is a decrease of economic product valued at about $200,000 per day, $6 million per month, or $75 million per year. The impact of this on the economy of the Uinta Basin and Utah in general will undoubtedly be felt in the near future.

Utah's other giant oil field, Greater Aneth in San Juan County, has had two production peaks. Discovered in 1956, the first peak resulted from prolific initial production in 1959-1960. More recently another peak came from a massive program of water flooding and from the drilling of additional wells. At the end of 1974, Greater Aneth was producing 22,800 barrels of oil daily, and by July 1975, production rose to 23,042 barrels per day. After dropping to a low of 21,577 barrels daily in May 1976, the rate climbed to about 22,305 barrels per day by September 1976. Field development drilling has been on 80-acre spacing with a 160-acre flood pattern. The new program is based on 40-acre well spacing and an upgraded 80-acre flood pattern. Production has been encouraging.

Greater Red Wash, another large Uinta Basin field, was discovered in 1951 and reached peak production in the early 1960's. In 1974 it averaged 10,425 barrels per day and in 1975 about 10,300 barrels per day. Its rate of production in mid-1976 was down to about 10,100 barrels per day.

After its discovery in 1966, Bridger Lake field in northern Summit County produced 1.3 million barrels in 1968, 1.1 million barrels in 1972, and 534,000 barrels in 1975—a decline in daily production from 3,600 barrels in December 1968 to 1,500 barrels in July 1975. In July 1976 production had dropped to 1,117 barrels per day, and by September 1976 daily production was at 1,080 barrels.

Lisbon field, south of Moab, produced just under 4 million barrels in its peak year in 1965, but by mid-1975 production had declined to about 1 million barrels. During July 1975, production averaged 2,933 barrels daily. In July 1976, production had dropped to 2,791 barrels per day. Almost 40 million barrels of oil have been produced at Lisbon field since its discovery in 1960.

The Upper Valley field southwest of Escalante produced 2.6 million barrels in its peak year in 1972 but is now down to 1.5 million barrels annually. Production dropped from 3,972 barrels per day in July 1975 to 3,033 barrels in September 1976. To date Upper Valley field is the first and only commercial producer in the Kaiparowits basin of southern Utah.

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Selected monthly production in the seven largest oil fields in Utah.

Oil fields	July 1975		December 1975		March 1976		May 1976		July 1976		September 1976	
	Barrels per day	Percent of total	Barrels per day	Percent of total	Barrels per day	Percent of total	Barrels per day	Percent of total	Barrels per day	Percent of total	Barrels per day	Percent of total
Greater Altamont-Bluebell, Duchesne and Uintah Counties	63,932	58.2	56,646	56.2	52,176	53.5	49,539	53.1	46,643	51.2	47,406	51.0
Greater Aneth, San Juan County	23,042	21.0	21,715	21.5	22,114	22.6	21,577	23.2	23,002	25.2	22,305	24.0
Greater Red Wash, Uintah County (Includes Walker Hollow and Wonsits Valley)	10,553	9.6	10,410	10.3	10,155	10.4	10,269	11.0	9,795	10.7	10,015	10.8
Upper Valley, Garfield County	3,972	3.6	3,432	3.4	3,506	3.7	3,376	3.7	3,154	3.5	3,033	3.3
Lisbon, San Juan County	2,933	2.7	2,839	2.8	2,867	2.9	2,725	2.9	2,791	3.1	2,721	2.9
Bridger Lake, Summit County	1,498	1.4	1,314	1.3	1,288	1.3	1,284	1.3	1,117	1.2	1,080	1.2
Pineview, Summit County	1,926	1.8	1,035	1.1	976	1.0	969	1.0	1,362	1.5	3,590	3.9
Remaining oil fields	1,967	1.7	3,459	3.4	4,408	4.6	3,408	3.8	3,288	3.6	2,686	2.9
TOTAL	109,823	100.0	100,850	100.0	97,490	100.0	93,247	100.0	91,152	100.0	92,836	100.0

OIL PRODUCTION DROPS

(continued from page 4)

A bright spot in Utah's petroleum picture is the increasing exploration in the overthrust belt area of Summit and Rich Counties and the growing production from the Pineview field, Summit County. In September 1976, Pineview had 6 wells producing 3,590 barrels daily. In July 1976 the field produced 1,362 barrels per day. More wells are being drilled in the field. Recently a well was completed 6½ miles southwest of the field. Several exploratory wells are also scheduled elsewhere in Summit, Rich, and Cache Counties.

Despite early production estimates at Pineview of between 4,000 and 6,000 barrels of oil daily in the first 2 months of 1977, it will take a greater increase in production there and additional discoveries elsewhere to offset the 17,000 barrel-per-day decrease at the Greater Altamont-Bluebell field.

Of the 120 wells drilled in 1976, only 2 small discovery wells were completed. In 1975, six discoveries were made of 198 wells drilled. Of the 6 only 1, at Pineview, was of major significance. At Greater Altamont-Bluebell field the peculiar nature of the reservoir and oil has made attempts at secondary recovery partly successful, often frustrating, and very expensive. Yet, only a revival of production at Greater Altamont-Bluebell or new production from large discoveries can halt this trend. Utah's oil production appears headed for a continuing decline.

CLOUDBURSTS PERIL HOMES, WRECK BRIDGE

Upper left, upper right, and lower left: Water cascading down steep slopes and streets in a Davis County subdivision in 1976 cut gullies in yards, undermined driveways and patios, and extensively eroded foundations and fill. Damage from such cloudburst-triggered floods is becoming more common as residences encroach upon Lake Bonneville benchland composed of lacustrine soils. *Lower right:* Cloudburst flood in summer of 1976 obliterated abutment of new bridge in Moab and forced closing of road after traffic had used it only for a few days. Configuration of stream channel directed the high velocity runoff against the stream bank. Bank and abutment were composed of gravel.

LAKE BELOW 1976 LEVELS

Great Salt Lake levels recorded (in feet above sea level) this fall and winter by the U. S. Geological Survey are:

Date	Boat harbor (south arm)	Saline (north arm)
November 1	4,200.30	4,199.05
November 15	4,200.35	4,199.05
December 1	4,200.35	4,198.95
December 15	4,200.40	4,199.00
January 1, 1977	4,200.45	4,199.00
January 15	4,200.50	4,199.05

The seasonal low level of 4,200.30 feet on November 1, 1976, appeared a month later than normal, undoubtedly in response to one of the driest autumns on record. The mid-January reading is 0.2 foot lower than the level at the same time a year ago. Unless normal or above normal precipitation falls in the watershed tributary to the lake in the spring, inflow will probably be far less than normal, and the lake can be expected to peak at 0.5 foot or more below the 1976 high mark of 4,202.25 feet.

Geologists and Landmen Elect 1977 Officers

The Utah Geological Association's new officers for this year are: President, Janet Y. Benjamins, Mountain Fuel Supply Company; President-Elect, Ronald Willden, Gold Resources, Incorporated; Program Chairman, Robert W. Osterstock, Cities Service Minerals; Secretary, Jack E. Smedley, U. S. Geological Survey; and Treasurer, Robert P. Barnes, Getty Oil Company. The UGA meets semimonthly on the first and third Mondays, usually at the Holiday Inn, downtown Salt Lake City.

The Utah Association of Petroleum and Mining Landmen elected Oliver Gushee, attorney, partner in Pruitt & Gushee, as President. Vice-President is Darwin Van De Graaff, executive director of the Utah Petroleum Association; Secretary, Clayton Parr, attorney with Martineau & Maak; and Treasurer, Kenneth Jensen, district landman for Getty Oil Company. The UAPML meets semimonthly on the first and third Thursdays in the University Club Building in Salt Lake City.

ON UTAH GEOLOGY . . .

U.S. Geological Survey Open-File Reports

Unpublished reports by the U. S. Geological Survey that describe the geology of Utah are kept on open-file at the Utah Geological and Mineral Survey, 606 Black Hawk Way, Salt Lake City. Because UGMS has only one copy of each report, they must be inspected at its offices and cannot be taken out. Copies of these reports may also be inspected at the USGS Public Inquiries Office, Federal Building, 125 South State Street, Salt Lake City, where reproducible copies are sometimes available.

Reports received at UGMS in late 1976 and January 1977 are:

76-766. *Gravity Survey of Pocatello Valley, Idaho and Utah*, by Cynthia J. Harr and Don R. Mabey, 1976.

76-811. *General Geology and Mineral Resources of the Coal Area of South-Central Utah,* by K. A. Sargent and Dan E. Hansen, 1976.

76-827. *Leasable Mineral and Waterpower Land Classification Map, Escalante Quadrangle, Utah and Arizona,* by J. E. Smedley, E. M. Pera, and G. A. Lutz, 1976.

76-828. *Leasable Mineral and Waterpower Land Classification Map of the Cedar City Quadrangle, Utah,* by E. M. Pera, J. E. Smedley, L. A. Simpson, and G. A. Lutz, 1976.

76-872. *Geophysical Logs of Five Holes Drilled in 1976 in the Kaiparowits Plateau Region, South-Central Utah*, by Howard Zeller, 1976.

77-43. *Geophysical Logs of 12 Test Holes Drilled in 1976 in the Alton-Kanab Coal Field, Kane and Garfield Counties, South-Central Utah,* by W. E. Bowers, 1976.

PROBES REVEAL FAULTING

Left: Geotechnical investigations for public facilities in the Cache Valley during the summer of 1976 revealed an active fault in soil materials in the excavation for the foundation of a culinary water tank. Geologist holds hammer parallel to fault plane (also indicated by arrow). *Lower left and below:* High-angle normal fault in Lake Bonneville sediments controls cut instability. Fault surface is exposed on right. Arrows indicate fault movement. Lacustrine gravel on left (down side of fault) has slid away from scarp (in heavy shadow). Face of scarp is about 7 feet high. Exposure is above subdivision in North Salt Lake.

Utah Lawmakers Mull Geologic Matters

The 42nd Utah Legislature which convened on January 10, 1977, has on its docket a number of matters of geological and natural resource interest.

Two important resolutions have been introduced, one establishing a state energy policy and another urging that a Federal research center on solar energy be located in Utah.

Among the bills introduced early in the session are measures that would (1) change the allocation of monies received from the Federal mineral leasing fund to various State agencies (including UGMS); (2) undertake means to control the level of Great Salt Lake; (3) change orders regarding the pooling of oil and gas interests; (4) establish Danger Cave State Park near Wendover; (5) improve facilities on Great Salt Lake; (6) authorize the purchase of islands in the lake for parks and game refuges; and (7) reduce earthquake hazards in Utah. The last one is a package of three bills.

The three earthquake hazard bills would: (1) establish a seismic safety advisory council to recommend safety programs, promote standards for construction, review and recommend changes in standards, and propose legislation; (2) give review and approval powers over Federal dam projects to the State Engineer; and (3) fund the preparation by UGMS of maps designating areas of seismic risk, as a guide to locating schools, hospitals, and public and private buildings.

If passed, the earthquake hazard bills, introduced by Representative Genevieve Atwood of Salt Lake City and Representative Ray Nielsen of Fairview, will have a profound effect on the future organization and activities of UGMS and other divisions of the Department of Natural Resources. In a future issue of *Survey Notes*, the new laws with geological and natural resource implications will be reviewed.

MULTI-BILLION $ DEAL . . .

Utah International Merges With GE

The merger of Utah International with General Electric was approved by shareholders of both companies, thus effecting the largest merger in the history of the United States and putting GE into the natural resources field for the first time. The merger was completed on December 20, 1976, with the free-tax exchange of about 41 million newly authorized GE common shares–a value of about $2.2 billion–for all 31.5 million shares of Utah International.

The merger included Ladd Petroleum Company of Denver, a wholly-owned subsidiary of Utah International, and its extensive interests: coal holdings in Australia, one of the world's largest steam coal mines, and other mineral, oil, gas, and land developments. Utah International's uranium interests were formed into an independent subsidiary out of GE's control until the year 2000, because of the U. S. Justice Department's objections to GE's being a supplier of nuclear power systems and nuclear fuel.

Utah International was incorporated in Ogden, Utah, on January 8, 1900, as Utah Construction Company. The name was changed to Utah International in 1971, two years after its heavy construction division was sold to the Fluor Corporation of Los Angeles. In recent years Utah International, headquartered in San Francisco, has specialized in mining.

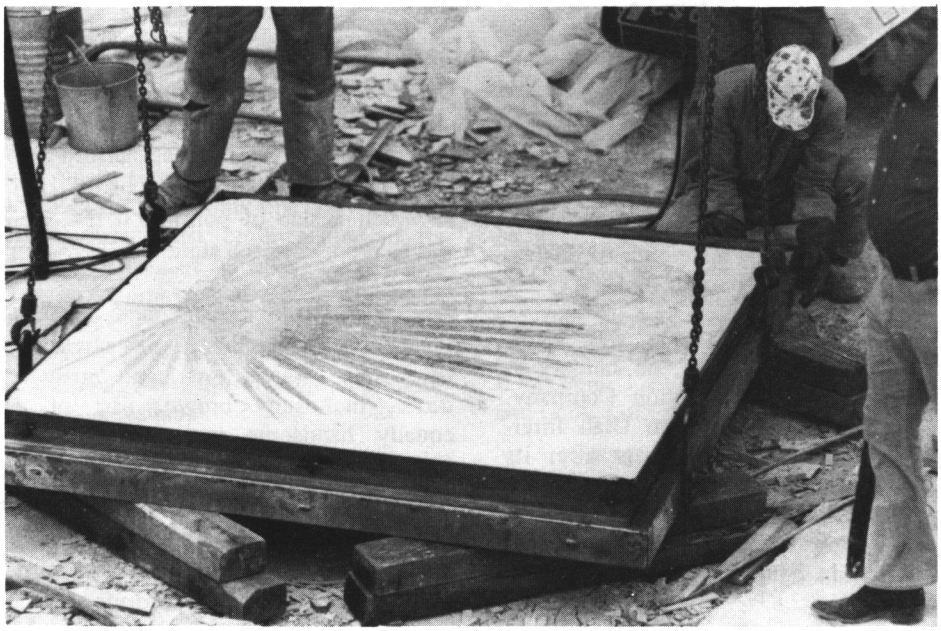
UTAH IDENTIFIED BY OIL SHALE

Upon request, in August 1975 UGMS sent a large piece of Uinta Basin oil shale to the Centinela Valley Gem and Mineral Club of Hawthorne, California, to be used in a decorative map of the U. S. in which a slab of polished native rock was to represent each state.

In a color photograph sent to UGMS from the club, Utah's characteristic shape stands out handsomely in dark, mahogany brown, part of an equally handsome array of distinctive contributions from the other 49 states.

The map, a Bicentennial project, is a permanent display at the Hawthorne Memorial Center in the California city.

MFS' FROND
(continued from page 1)



Crew from Mountain Fuel removed slab from its shale bed and prepared it for trucking to Salt Lake City and then to Provo. *(Photo courtesy of Mountain Fuel Supply Company)*

shale weighing 1,366 pounds. Carefully trucked to Salt Lake City on a cushioned steel pallet, the fossil was intended as a display in the main lobby of Mountain Fuel's general office on Second South Street.

But frustrating the best preparations, Mother Nature began to act contrariwise. The 50-million-year-old shale began to show definite signs of distress and disintegration, and plans to stand the weighty slab upright in the lobby had to be abandoned.

The fossil was transferred to the paleontology lab of Brigham Young University where it was framed and preservative was applied to the surface of the slab. Careful work also exposed more of the frond, making it an even more spectacular specimen. It is hoped a lightweight replica can be made to serve as a portable exhibit for Mountain Fuel's local offices in the region.

At present the exact paleontological designation of the palm has not been determined.

State of Utah—Department of Natural Resources
UTAH GEOLOGICAL AND MINERAL SURVEY
606 Black Hawk Way
Salt Lake City, Utah 84108

Address Correction Requested

Meeting On Geologic Hazards

The Governor's Conference on Geologic Hazards is to be held from 8:30 a. m. to 5:00 p. m. on March 7 at the Hilton Hotel in Salt Lake City.

Conference topics will include these matters dealing with geologic hazards: land-use planning, engineering and architectural problems, natural-hazard insurance, role of the news media, ordinance and statutes, and the responsibilities of state and local agencies.

The public is welcome. Register with the conference chairman, Bruce N. Kaliser, at the Utah Geological and Mineral Survey. Registration of $10.00 includes luncheon.

UTAH GEOLOGICAL AND MINERAL SURVEY
SURVEY NOTES

State of Utah ..... *Scott M. Matheson, Governor*
Department of Natural Resources ..... *Gordon E. Harmston, Executive Director*
Utah Geological and Mineral Survey ..... *Donald T. McMillan, Director*
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